

Appl. No. 10/016,132
Response dated February 17, 2005
Reply to Office Action mailed November 17, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the earlier versions of this application:

Listing of Claims:

Claim 1 (currently amended) A reactor vessel, for generating hydrogen from a hydride solution in presence of a catalyst, the reactor vessel comprising:

a) —a plurality of reaction chambers and a plurality of coolant chambers alternating with one another, each reaction chamber being configured to receive the hydride solution and to bring at least a portion of the hydride solution in contact with the catalyst, each coolant chamber being configured to receive a coolant flow; and

b) —a plurality of reactor plates, each having a first face and a second face in opposing relation with the first face, wherein the first face defines a solution flow field and a portion of one reaction chamber, and the second face defines a coolant flow field and a portion of one coolant chamber;

c) —wherein each reactor plate is rectangular, and includes a solution inlet and a solution outlet located opposite to one another and in communication with the solution flow field, and a coolant inlet and a coolant outlet located opposite to one another and in communication with the coolant flow field and wherein the solution inlet, the solution outlet, the coolant inlet and the coolant outlet all extend through the reactor plates, for forming distribution ducts from a plurality of similar reactor plates stacked together;

d) —and wherein a plurality of separator plates alternate with the reaction reactor plates, to define the plurality of reaction chambers alternating with the plurality of coolant chambers, each reaction chamber being in fluid communication with an adjacent one of the plurality of reaction chambers and each coolant chamber being in fluid communication with an adjacent coolant chamber, each separator plate including openings providing inlets and outlets to for the coolant and the hydride solution aligned

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with the ~~solution and coolant and solution~~ inlets and outlets of the reactor plates, ~~whereby the distribution ducts are formed extending through the reactor plates and the separator plates to distribute both the hydride solution and the coolant to the reaction and coolant chambers and to collect the hydride solution and the coolant from the reaction and the coolant chambers;~~

wherein each solution flow field comprises a common reaction chamber, and a plurality of channels opening into the common reaction chamber, wherein the catalyst is provided in the reaction chamber, and wherein a rim is provided around and partially defining the reaction chamber; and

wherein gasket grooves are provided between the reactor and separator plates, with one gasket groove being provided in the rim around each reaction chamber, and gaskets are provided in the gasket grooves between adjacent pairs of reactor and separator plates.

~~wherein each reactor plate includes gasket grooves on the first and second faces thereof, and a gasket is provided between each pair of adjacent reactor and separator plates, to form seals for the reaction and coolant chambers.~~

Claim 2 (cancelled)

Claim 3 (previously presented) The reactor vessel of claim 1, wherein the solution flow field comprises a plurality of solution channels therein and the coolant flow field comprises a plurality of coolant channels.

Claim 4 (original) The reactor vessel of claim 3, further comprising a catalyst located on at least a portion of the plurality of the solution channels.

Claim 5 (original) The reactor vessel of claim 4, wherein the catalyst is in pellet form.

Claim 6 (cancelled)

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~~Claim 7 (previously presented) The reactor vessel of claim 3, wherein the plurality of~~
the solution channels extend from the solution inlet to the solution outlet, and ~~the~~ the solution
plurality of coolant channels extend from the coolant inlet to the coolant outlet.

Claim 8 (previously presented) The reactor vessel of claim 7, wherein the reactor
plate is rectangular, the solution inlet and the solution outlet being located proximate to
diagonal corners thereof, and the coolant inlet and coolant outlet being located
proximate to remaining diagonal corners thereof.

Claim 9 (cancelled)

Claim 10 (cancelled)

Claim 11 (previously presented) The reactor vessel of claim 7, wherein the reactor
plates and the separator plates are positioned in substantially parallel spaced
relationship, thereby forming a stack of the plurality of reactor vessels, and wherein
means are provided for clamping the reactor plates and the separator plates together.

Claim 12 (currently amended) The reactor plate of claim 11, wherein the solution
channels are substantially parallel.

Claim 13 (original) The reactor plate of claim 12, wherein the coolant channels are
substantially parallel.

Claim 14 (cancelled)

Claim 15 (cancelled)

Claim 16 (cancelled)

Claim 17 (cancelled)

Claim 18 (cancelled)

Claim 19 (cancelled)

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Claim 20 (cancelled)

Claim 21 (cancelled)

Claim 22 (cancelled)

Claim 23 (cancelled)

Claim 24 (cancelled)

Claim 25 (cancelled)

Claim 26 (cancelled)

Claim 27 (cancelled)

Claim 28 (previously presented) The reactor vessel of claim 3, wherein the solution flow field comprises a plurality of tortuous channels extending between the solution inlet and the solution outlet.

Claim 29 (cancelled)

Claim 30 (previously presented) The reactor vessel of claim 28, wherein the coolant flow field comprises a plurality of tortuous channels extending between the coolant inlet and the coolant outlet.

Claim 31 (cancelled)

Claim 32 (previously presented) A system for generating hydrogen from a hydride solution in presence of a catalyst, the system comprising:

- a) a solution supply means for supplying the hydride solution;
- b) a coolant supply means for supplying a coolant flow; and
- c) a reactor vessel as defined in claim 1.

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Claim 33 (previously presented) The system of claim 32, wherein the coolant supply means is configured to control at least one of the temperature and the flow rate of the coolant flow through the coolant chamber, thereby improving control of the temperature of the hydride solution in the reaction chamber.

Claim 34 (cancelled)

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